Panel: Programming in the Small or What?

Dennis Brylow (Marquette)
Tony Hosking (Purdue)
Lenny Pitt (UIUC)
Bruce Weide (Ohio State)
Traditional programming courses

- Step-by-step acquisition of basic building blocks:
  - variables
  - expressions
  - assignment
  - subroutines
Traditional programming courses

- Emphasis on:
  - Control structures vs abstraction
  - Simple explicit data structures: arrays, lists, etc.
  - Subroutines as unit of abstraction
And yet...

- Modern languages like Java, C#, Python support rich built-in abstractions
- Heavily reused by real programs
- Tension: teaching compositional programming versus bottom-up
Even more...

* Programming in the small emphasizes implementation over design.
* Should we also be teaching scientists to think computationally by composing computational abstractions?
* Real programs "maintained" not "written"
And more...

- What about programming in the medium and large?
- Extreme programming
- Testing (eg, unit tests)
- UML
- Software process
Computational thinking?

- More than programming...
- Communication of computational thinking in the language of software designers?
- What else should it be...?